



The Integrated Environmental Strategies (IES) Program in Seoul, South Korea

What is the IES Program?

The Integrated Environmental Strategies (IES) program engages developing countries to build support for “integrated” planning that reduces emissions of both global greenhouse gases (GHGs) and local air pollutants. The program promotes the analysis and local support for implementation of policies and technologies that have multiple public health, economic, and environmental benefits. By analyzing and implementing integrated policies and measures such as clean energy (e.g., renewable energy), energy efficiency (e.g., improved energy efficiency standards for appliances), and public transportation (e.g., converting diesel buses to compressed natural gas), IES partners have an opportunity to make a positive impact on local air quality, public health, and the economy, while at the same time reducing GHGs at the global level.

Background of the Program in South Korea

South Korea’s IES work was initiated in February 1999 with a brief analysis of potential co-benefits in the metropolitan area of Seoul. Building on this initial analysis, the Korean government completed a national co-benefits assessment in 2001 (see <www.epa.gov/ies/southkorea.htm#Results>) using the IES co-benefits framework, which proved to be a useful tool for policymakers.

Following the initial phase of South Korea’s IES analysis, the Korean Ministry of Environment (MOE) met with non-governmental organizations and businesses to discuss the results. Although successful, the group of stakeholders identified a need for more health effects information and a closer link to policy implementation. This meeting prompted Phase 2 of South Korea’s IES work, which linked a specific policy plan—the Seoul Air Quality Management Plan (SAQMP)—to the analysis of GHG emission reductions.

Table 1: Mitigation Measures Analyzed in Phase 2 of South Korea’s IES Analysis

Emission Source	Mitigation Measure	Sample Features of Measures
Point Source	• Fuel regulation	• Promote low-sulfur fuel
	• Emission standards	• Develop stricter standards for small industrial sources
	• Voluntary agreement	• Monitor and assist voluntary programs
Area Source	• Fuel regulation	• Promote low-sulfur fuel and natural gas
	• NO _x source management	• Encourage use of low-NO _x boilers
	• Demand management	• Require eco-building certification
Mobile Source	• Emission standards	• Develop stricter emission standards for new cars
	• Clean vehicle	• Promote electric or hybrid cars

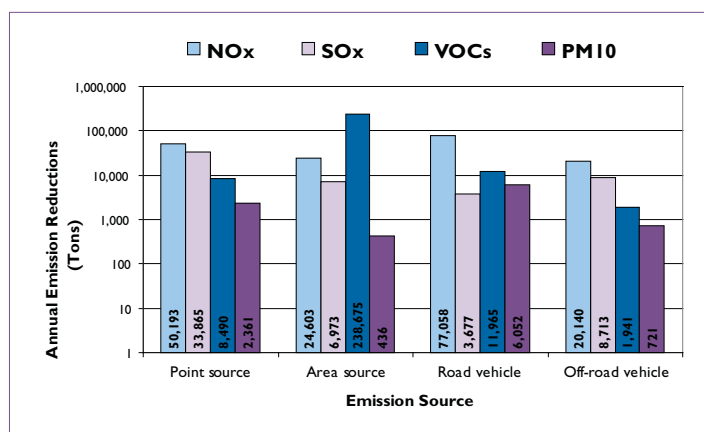
This figure illustrates sample features (right column) of the mitigation measures (middle column) analyzed in Phase 2 of South Korea’s IES analysis, along with their corresponding emission source categories of air pollution (left column).



Photographs courtesy of National Renewable Energy Lab (NREL) and Collin Green



Figure 1: Estimated Annual Emission Reductions Resulting from Mitigation Measures During the Period 2001-2014



This figure shows—on a logarithmic scale—the estimated annual emission reductions of nitrogen oxides (NO_x), sulfur oxides (SO_x), volatile organic compounds (VOCs), and particulate matter smaller than ten microns in diameter (PM₁₀) from point, area, and mobile (on and off-road vehicle) sources. Each emission source category (along the x-axis) represents potential emission reductions from that particular source through the implementation of mitigation measures listed in Table 1.

Since the beginning of 2006, Dr. Yeora Chae of the Korea Environment Institute (KEI)—a policy analysis group funded by MOE—has led the IES-South Korea program, along with a team of experts, including Dr. Jeongim Park (also from KEI). Kangwon University has collaborated on different sections of the IES analysis as well, including developing mitigation scenarios, performing air quality modeling, and identifying concentration-response functions for the health effects analysis.

“The IES program is providing important new information for consideration by our Ministry in its development of a greenhouse gas emissions reduction strategy.”

— Mr. Tae-Bong Jeon,
Director General,
Air Quality Management Bureau, Ministry of Environment

The main goals for Phase 2 of South Korea’s IES program are to analyze emission reduction potential for both carbon dioxide (CO₂) and local air pollutants, as well as the implementation cost of specific measures from SAQMP. Additional air quality policy measures that are not currently part of the SAQMP will be analyzed for their co-benefit potential. The study will conclude with a relative ranking of the policy measures according to their co-benefit potential and other key criteria. Finally, this information will be disseminated to stakeholders, experts, and policymakers.

Results of the Project

The IES program has led to the integration of an air pollution inventory and analysis of emission reductions in an annually produced document. The National Institute of Environmental Research (see <eng.nier.go.kr>) regularly inventories several air pollutants by emissions source, including point sources, area sources, and mobile sources. KEI examined mitigation measures that could reduce emissions from those respective sources (see Table 1) and estimated the resulting emission reductions. Together, all of the mitigation measures could annually reduce almost 172,000 tons of nitrogen oxides (NO_x), more than 53,000 tons of sulfur oxides (SO_x), 9,500 tons of particulate matter smaller than 10 microns in diameter (PM₁₀), and more than 261,000 tons of volatile organic compounds (VOCs) (see Figure 1).

Additionally, the IES analysis projects future CO₂ emission reductions from the same measures. For example, by promoting increased cogeneration and solar energy in residences, the IES analysis estimated that by 2014, nearly 2,155,000 households will cumulatively reduce CO₂ emissions by approximately 1,151,866 tons. In future work, the team will analyze individual emission reduction measures and estimate their resulting health benefits within the context of the SAQMP.

On April 7, 2005, a Ministerial Decree created the Task Force on GHG Reductions (Task Force), which—among other responsibilities—was charged with developing medium- and long-term strategies for GHG emission reductions and calculating national GHG emissions. Most notably, the Task Force was also charged with creating integrated policies for reducing emissions of GHGs and local air pollutants. The Prime Minister was the chair of the GHG Reduction Committee which oversaw the Task Force. At the end of its term, the Task Force issued an important final report and suggested several GHG mitigation strategies including: establishment of a GHG management system; integration of existing environmental policies and GHG mitigation measures; and the assessment of climate change impacts and adaptation.

For More Information

Visit the IES Web site at
<www.epa.gov/ies>.
You may also e-mail <ies@epa.gov>.

